

**Amendments to the Claims**

This listing will replace all prior versions and listings of claims in the application:

**Listing of Claims**

1 (canceled).

2 (currently amended). A method of case hardening an article formed of at least one material selected from the group consisting of titanium, zirconium, alloys of titanium, alloys of zirconium and alloys of titanium and zirconium, said method comprising the steps of (a) heat-treating said article in an oxidising atmosphere at a temperature in the range of 700 to 1000 °C so as to form an oxide layer on the article; and (b) further heat-treating the article in a vacuum or in a neutral or an inert atmosphere at a temperature in the range of 700 to 1000 °C so as to cause oxygen from the oxide layer to diffuse into the article whereby to produce a sigmoid-shaped hardness profile.

3 (original). A method as claimed in claim 2, wherein the oxidising atmosphere contains both oxygen and nitrogen.

4 (currently amended). A method as claimed in claim 4~~3~~, wherein the oxidising atmosphere in step (a) is air.

5 (currently amended). A method as claimed in claim-4~~2~~, wherein the time for heat-treatment in step (a) is from 0.1 to 1 hour.

6 (currently amended). A method as claimed in claim 42, wherein the time for heat-treatment in step (a) is from 0.3 to 0.6 hour.

7 (currently amended). A method as claimed in claim 42, wherein the heat-treatment in step (a) is effected at atmospheric pressure.

8 (currently amended). A method as claimed in claim 42, wherein steps (a) and (b) are repeated at least once.

9 (previously presented). A method as claimed in claim 42, wherein the temperature in step (a) is 700 to 900 °C.

10 (original). A method as claimed in claim 9, wherein the temperature in step (a) is 800 to 900 °C.

11 (currently amended). A method as claimed in claim 42, wherein the temperature in step (b) is 700 to 900 °C.

12 (original). A method as claimed in claim 11, wherein the temperature in step (b) is 800 to 900°C.

13 (currently amended). A method as claimed in claim 42, wherein the heat treatment in step (b) is effected at a pressure of not more than  $1.3 \times 10^{-2}$  Pa ( $1 \times 10^{-4}$  Torr).

14 (original). A method as claimed in claim 13, wherein the heat treatment in step (b) is effected at a pressure of about  $1.3 \times 10^{-4}$  Pa ( $1 \times 10^{-6}$  Torr).

15 (currently amended) A method as claimed in claim 12, wherein the heat treatment in step (b) is effected for a time in the range of 10 to 30 hours.

16 (previously presented). An article formed of a metal or alloy selected from the group consisting of titanium, zirconium, alloys of titanium and alloys of zirconium, said article having a hardened metallic case, strengthened by diffused oxygen; wherein the article has a sigmoid-shaped hardness profile across said hardened case.

17 (original). An article as claimed in claim 16, wherein the depth of the hardened case is greater than 50  $\mu\text{m}$ .

18 (original). An article as claimed in claim 16, wherein the depth of the hardened case is in the range 200 to 500  $\mu\text{m}$ .

19 (currently amended). An article as claimed in claim 16, wherein a further comprising a layer of low-friction material is provided on top of the hardened case.

-- 20 (new). A method of case hardening an article formed of at least one material selected from the group consisting of titanium, zirconium, alloys of titanium, alloys of zirconium and alloys of titanium zirconium, said method comprising the steps of (a) heat-treating said article in an oxidising atmosphere containing both oxygen and nitrogen at a temperature in the range of 700 to 1000 °C so as to form an oxide layer on the article; and (b) further heat-treating the article in a vacuum or in a neutral or an inert atmosphere at a temperature in the range of 700 to 1000 °C so as to cause oxygen from the oxide layer to diffuse into the article, wherein the time for heat-treatment in step (a) is from 0.1 to 1 hour.

21. (new) A method of case hardening an article formed of at least one material selected from the group consisting of titanium, zirconium, alloys of titanium, alloys of zirconium and alloys of titanium zirconium, said method comprising the steps of (a) heat-treating said article in an oxidising atmosphere containing both oxygen and nitrogen at a temperature in the range of 700 to 1000 °C so as to form an oxide layer on the article; and (b) further heat-treating the article in a vacuum or in a neutral or an inert atmosphere at a temperature in the range of 700 to 1000 °C so as to cause oxygen from the oxide layer to diffuse into the article, wherein the heat treatment in step (b) is effected at a pressure of not more than  $1.3 \times 10^{-2}$  Pa ( $1 \times 10^{-4}$  Torr). --